

GH responses to two consecutive bouts of respiratory muscle endurance training in healthy adults.

A. Sartorio, F. Agosti, A. Patrizi, G. Tringali, N. Marazzi, M. Giunta, E.E. Muller, and A.E. Rigamonti

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Repetition of voluntary exercise bouts and of different pharmacological GH-releasing stimuli at 2-h intervals is associated with a complete abolishment of GH responsiveness. By contrast, a different pattern is observed after repeated neuromuscular electrostimulation, which is characterized by preservation of GH responsiveness. Aim of the study was to evaluate GH responses to repeated bouts of respiratory muscle endurance training (RMET) by mean of a specific commercially available device (Spiro Tiger®). Eight healthy men underwent an incremental progressive RMET protocol of 11 daily sessions. Blood samplings for GH, cortisol and lactate (LA) determinations were collected during the 12th session, which was composed of two consecutive bouts of RMET (of identical intensity and duration: 1 min at a respiration rate of 28 acts/min, 5 min at 32 acts/min, 5 min at 34 acts/min, 4 min at 36 acts/min) at a 2 h interval. Baseline GH levels (mean: 0.9 ± 0.4 ng/ml) significantly ($p < 0.01$) increased after the first bout of RMET (peak: 15.7 ± 4.0 ng/ml). The administration of the second bout of RMET resulted in a significantly lower ($p < 0.05$) GH increase (peak: 3.9 ± 0.8 ng/ml) in comparison with the first one. Baseline LA levels (mean: 1.2 ± 0.1 mmol/l) significantly increased ($p < 0.001$) after the first bout of RMET (peak: 2.3 ± 0.2 mmol/l). The administration of the second RMET bout resulted in a comparable LA increase (from a basal value of 1.2 ± 0.1 mmol/l up to a peak of 2.0 ± 0.1 mmol/l, $p < 0.001$). The first bout of RMET caused a significant increase of cortisol levels ($p < 0.01$), starting from a basal mean value of 142.9 ± 9.4 ng/ml up to a peak of 188.8 ± 10.3 ng/ml. By contrast, the second bout of RMET did not induce any significant change of cortisol levels (basal: 149.1 ± 9.0 ng/ml, peak: 168.5 ± 5.1 ng/ml). In conclusion, a single bout of RMET is capable of stimulating GH and cortisol secretions and LA production. When a second bout is repeated after 2 h, there is a blunting of GH and cortisol responses with a preservation of LA release. Further studies are needed to schedule long-term RMET protocols capable of persistently stimulating GH-IGF-I release and to maximally enhance the ergogenic and metabolic benefits of this intervention either in normal subjects (e.g. athletes) or patients with an impairment of motor capabilities requested to perform normal daily activities (i.e. severely obese and elderly people).

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